

Claims

What is claimed is:

1. A load bearing arrangement for use with a work machine of the type having a platform, comprising:

at least one member structured and arranged for coupling to the platform and having a longitudinal axis; and

at least one reinforcing structure attached to said member at at least one identified failure-prone location and oriented at an angle β from said longitudinal axis.

2. The load bearing arrangement as set forth in claim 1 wherein said member comprises:

at least one top plate;

at least one bottom plate; and

at least one pair of spaced apart side plates each attached to said top plate and said bottom plate.

3. The load bearing arrangement as set forth in claim 2 wherein one said reinforcing structure is attached to one said side plate; and another said reinforcing structure is attached to the other said side plate.

4. The load bearing arrangement as set forth in claim 2 wherein:

each said side plate has an inner surface; and

at least one said reinforcing structure is attached to at least one said inner surface.

5. The load bearing arrangement as set forth in claim 1 wherein said reinforcing structure comprises:

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a base portion; and
a rib portion extending from said base portion.

6. The load bearing arrangement as set forth in claim 1
wherein β is between zero degrees and ninety degrees.

7. The load bearing arrangement as set forth in claim 1
wherein said reinforcement structure is laser welded to said member.

8. The load bearing arrangement as set forth in claim 1
wherein said reinforcement structure is substantially flat.

9. The load bearing arrangement as set forth in claim 1
wherein said reinforcement structure is substantially cylindrical.

10. The load bearing arrangement as set forth in claim 1
wherein said member is pivotally coupled to a second member.

11. The load bearing arrangement as set forth in claim 1
further comprising an attachment pivotally coupled to said member.

12. The load bearing arrangement as set forth in claim 11
wherein said attachment comprises a bucket.

13. A load bearing apparatus, comprising:
a work machine having a platform;
at first member, having a longitudinal axis, coupled to said
platform;

a first movement means for moving said first member relative to said platform;

a second member, having a longitudinal axis, pivotally coupled to said first member;

a second movement means for moving said second member relative to said first member; and

at least one reinforcing structure attached to at least one of said first member or said second member and oriented at an angle β from a respective said longitudinal axis.

14. The load bearing apparatus as set forth in claim 13 wherein said first and said second movement means comprises hydraulic cylinders.

15. The load bearing apparatus as set forth in claim 13 further comprising an attachment attached adjacent an end of said second member.

16. The load bearing apparatus as set forth in claim 13 wherein said attachment comprises a bucket.

17. The load bearing apparatus as set forth in claim 13 wherein at least one of said reinforcing structures are attached to at least one of said first or said second members at at least one identified failure-prone location.

18. A method of reinforcing a load bearing member for use with a work machine, comprising the steps of:
simulating a loading condition on the member;
determining at least one location where the member is prone to buckling based on said simulation step;

providing the member with at least one reinforcing structure at said location.

19. The method as set forth in claim 18 wherein said simulation step is performed by a computer.

20. The method as set forth in claim 18 wherein said reinforcing member is laser welded to the member.